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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 98P2826P	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/DE99/03214	International filing date (day/month/year) 30 September 1999 (30.09.99)	Priority date (day/month/year) 30 September 1998 (30.09.98)
International Patent Classification (IPC) or national classification and IPC H04Q 11/04		
Applicant INFINEON TECHNOLOGIES AG		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☒ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 28 April 2000 (28.04.00)	Date of completion of this report 09 January 2001 (09.01.2001)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/DE99/03214

I. Basis of the report

1. With regard to the elements of the international application:*

- ☐ the international application as originally filed
- ☒ the description:
pages _____ 2-22 _____, as originally filed
pages _____, filed with the demand
pages _____ 1, 1a _____, filed with the letter of _____ 12 December 2000 (12.12.2000)
- ☒ the claims:
pages _____ 2-21 _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages _____ 1 _____, filed with the letter of _____ 12 December 2000 (12.12.2000)
- ☒ the drawings:
pages _____ 1/5-5/5 _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____
- ☐ the sequence listing part of the description:
pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1-21	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-21	NO
Industrial applicability (IA)	Claims	1-21	YES
	Claims		NO

2. Citations and explanations

This report makes reference to the following documents
(D) :

D1: WO-A-97/20396 (Analog Devices), corresponds to US-A-5 757 803 cited on page 2, line 28

D2: EP-A-0 795 977 (Motorola)

D3: Article by von Sugimoto et al. [BOSTON ICC/89]

D4: EP-A-0 923 221 (Northern Telecom), published 16 June 1999

**D5: EP-A-0 889 614 (Integrated Telecom Express)
published 7 January 1999.**

A line terminator unit which transmits and receives broad-band signals, in which the broad-band signals are composed of a low-frequency (ISDN) voice signal and a higher-frequency (ADSL) data signal and in which the frequency bands of the two signals substantially do not overlap is, as acknowledged in the description of the present application on pages 2 and 3, already known, e.g. from **D1**, in which a frequency separating filter (splitter) with

analog filters is used (see Fig. 1A).

The subject matter of Claim 1 differs from this known device only in that a digital frequency separating filter with at least one programmable digital filter is used, which splits the low-frequency voice signal from the higher-frequency data signal.

However, the use of (programmable) digital filters instead of the usual analog filters can be considered as simply standard practice which does not go beyond normal technical knowledge, and would be straightforward for a person skilled in the art, especially since the resulting advantages (ease of integration, adaptability, cost reductions, etc.) are readily foreseeable. It should also be noted that the present claimed use of programmable digital filters cannot be seen as inventive because of course most digital filters are not implemented as hard-wired filters, but as programmable filters (predominantly via a program in a digital signal processor DSP). The use of adaptive and programmable filters, e.g. FIR (Finite Impulse Response) or IIR (Infinite Impulse Response) filters is clearly common general knowledge in the field of communications. Therefore the above differentiating feature does not add anything inventive to the subject matter of Claim 1.

Irrespective of this, it should also be noted that an ADSL/ISDN transmission system is already known from the cited prior art document **D2**, in which voice signals as well as data signals of various frequency bands can be transmitted by means of a single wire (twisted pair) and in which the subscriber and the central office are equipped with line terminator units which each have a splitter (see Fig. 3). This splitter (36, 44) is not

described further in **D2**. On the contrary, the ADSL transceivers (receiver/transmitters) are described in Figures 4ff. In particular, the arrangement of the receiving part shown in Fig. 12 indicates that a decimator with a digital ISDN filter is used to filter out the low-frequency ISDN signals. Therefore a digital splitter also exists in **D2**, as claimed in Claim 1, which splits the low-frequency voice signal and the higher-frequency data signal from each other. Although not explicitly mentioned, programmable digital filters are probably also used in **D2**.

From the starting point of the system known from **D2**, in which the ISDN signals are split from the ADSL data by means of a digital splitter, a person skilled in the art would arrive at the claimed device without needing to be inventive.

Therefore the subject matter of Claim 1 lacks an inventive step in relation to **D1** as well as **D2** according to PCT Article 33(3).

Dependent Claims 2 to 21 appear to contain no additional features which, combined with the features of any claim to which they refer, meet the PCT requirements for inventive step. The reasons are as follows:

The use cited in Claims 2 and 3 of A-D and D-A converters as well as low and high pass filters is already known from **D2**. The use of a decimation filter, an interpolation filter, a Sigma-Delta A-D converter and a DSP as defined in Claims 4, 5 and 7 can also be deduced from **D2** (see particularly Fig. 8 & 12).

The additional features of Claims 14 to 17, which relate

to the use of an echo canceller, are known from the cited document **D3** - see paragraph 2.1 and Fig. 1.

The features cited in the remaining claims can either be directly derived from the above-mentioned prior art (e.g. the use of ADSL/ISDN or POTS) or are of no independent inventive significance, as they would be straightforward for a person skilled in the art.

The features of dependent Claims 2 to 21 add nothing inventive to the subject matter of Claim 1, either individually or in combination.

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VI. Certain documents cited

1. Certain published documents (Rule 70.10)

Application No. Patent No.	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
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See Supplemental Box

2. Non-written disclosures (Rule 70.9)

Kind of non-written disclosure	Date of non-written disclosure (day/month/year)	Date of written disclosure referring to non-written disclosure (day/month/year)
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Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: VI

Neither priority document was available for examination by the International Preliminary Examining Authority.

This report has been established on the assumption that all the claims enjoy the priority of the filing date of the priority document. Should this later prove not to be the case, documents **D4** and **D5** cited in the international search report, which were published between the two priority dates, could become relevant in a later regional phase.